

CLAIMS

1. Method for measuring quality of service at the application level in a telecommunication network (N), characterised in that it comprises the steps of:

5       - providing an activation function (A) for carrying out sessions at the application level on said network (N),

          - carrying out a session by means of said function (A), by measuring (F) and storing ( $H_k$ ), in a set of  
10 points ( $S_1, \dots, S_k, \dots, S_n$ ) of said network (N), data indicative of the behaviour of said network and verifying (B) an emergence of a critical situation in relation to said quality of service,

          - generating a trigger signal (Trigger) when said  
15 critical situation emerges, and

          - collecting (H), by effect of the generation of said trigger signal, said data indicative of the behaviour of the network measured and stored in said set of points of the network (N), the data thus  
20 collected being indicative of the quality of service of the network (N) itself.

2. Method as claimed in claim 1, characterised in that said step of measuring (F) and storing ( $H_k$ ) said data indicative of the behaviour of said network (N) is  
25 carried out in a plurality of different points ( $S_1, \dots, S_k, \dots, S_n$ ) of said network.

3. Method as claimed in claim 2, characterised in that said step of measuring (F) said data indicative of the behaviour of said network is carried out in  
30 synchronised fashion (Sync) in said different points ( $S_1, \dots, S_k, \dots, S_n$ ) of said network.

4. Method as claimed in claim 2 or claim 3, characterised in that it comprises the steps of:

- storing ( $H_k$ ) said data indicative of the behaviour of said network at the level of the corresponding point of said set, and

- collecting said data indicative of the behaviour  
5 of said network (N) at a centralised level (H) by effect of the generation of said trigger signal.

5. Method as claimed in any of the claims 2 a 4, characterised in that it comprises the steps of:

- providing a centralised function (M) for managing  
10 the quality of service of the network,

- sending said trigger signal (Trigger) to said centralised function (M), and

- transmitting said trigger signal starting from  
said centralised function (M) to the points of said set  
15 ( $S_1, \dots, S_k, \dots, S_n$ ) in order to proceed with the collection of said data indicative of the behaviour of said network.

6. Method as claimed in any of the previous claims, characterised in that it comprises the steps of:

20 - associating to said activation function (A) a control function (B) sensitive to data that may be indicative of critical situations relating to the quality of service of the network, and

- subjecting said data that may be indicative of  
25 critical situations relating to the quality of service of the network to filtering (212) through said control function (B), said control function (B) being able to generate said trigger signal (214) by effect of said filtering function (212).

30 7. Method as claimed in claim 6, characterised in that said activation function (A) and said control function (B) co-operate with each other according to a general agent/server configuration, in which said activation function (A) acts as an agent and said  
35 control function (B) acts as a server.

8. Method as claimed in any of the previous claims, applied to the measurement of the quality of service of a telecommunication network comprising a plurality of interfaces (Gi, Gb), characterised in that said step of  
5 measuring in a set of points (S<sub>1</sub>, ..., S<sub>k</sub>, ..., S<sub>n</sub>) of said network (N) data indicative of the behaviour of the network (N) itself implies monitoring the data transiting on one of said interfaces (Gi, Gb).

9. Method as claimed in any of the previous claims,  
10 characterised in that the step of storing (H) data indicative of the behaviour of said network in a set of points (S<sub>1</sub>, ..., S<sub>k</sub>, ..., S<sub>n</sub>) of said network (N) entails storing data relating to a given time window.

10. Method as claimed in any of the previous  
15 claims, characterised in that it comprises the step of providing at least a respective transmission channel (C, C<sub>t</sub>) to forward at least one signal between:

- said trigger signal to the points of said set (S<sub>1</sub>, ..., S<sub>k</sub>, ..., S<sub>n</sub>), and
- 20 - said data indicative of the behaviour of the network (N) measured (F) and stored (H) in the points of said set.

11. Method as claimed in any of the claims 1 to 10, characterised in that it comprises the step of  
25 transmitting on said network being monitored (N) at least a signal between:

- said trigger signal to the points of said set (S<sub>1</sub>, ..., S<sub>k</sub>, ..., S<sub>n</sub>), and
- said data indicative of the behaviour of the  
30 network (N) measured (F) and stored (H) in the points of said set.

12. Method as claimed in claim 11, characterised in that it comprises the step of providing in the points of said set (S<sub>1</sub>, ..., S<sub>k</sub>, ..., S<sub>n</sub>) a filtering function

(T) to intercept said trigger signal transmitted on said network (N) being monitored.

13. System for measuring the quality of service at the application level in a telecommunication network  
5 (N), characterised in that it comprises:

- at least one activating apparatus (A) for carrying out sessions at the application level on said network (N),

- at least one monitoring apparatus ( $S_1, \dots, S_k,$   
10  $\dots, S_n$ ) to measure (F) and store ( $H_k$ ) in a set of points ( $S_1, \dots, S_k, \dots, S_n$ ) of said network (N) data indicative of the behaviour of said network,

- at least one testing apparatus (B) to test for the occurrence of critical situations related to said  
15 quality of service and to generate, at the emergence of a said critical situation, a warning signal (Trigger), and

- a collecting apparatus (H) to collect, by effect of the generation of said trigger signal, said data  
20 indicative of the behaviour of the network measured and stored in said set of points of the network (N), the data thus collected being indicative of the quality of the network (N) itself.

14. System as claimed in claim 13, characterised in  
25 that it comprises a plurality of said monitoring apparatuses ( $S_1, \dots, S_k, \dots, S_n$ ) to measure (F) and store ( $H_k$ ) in a plurality of different points ( $S_1, \dots, S_k, \dots, S_n$ ) of said network (N) said data indicative of the behaviour of the network (N).

30 15. System as claimed in claim 14, characterised in that it comprises synchronisation modules (Sync) associated to said plurality of monitoring apparatuses ( $S_1, \dots, S_k, \dots, S_n$ ) to measure (F) said data indicative of the behaviour of said network (N) in

synchronised fashion on said different points ( $S_1, \dots, S_k, \dots, S_n$ ) of said network (N).

16. System as claimed in claim 14 or claim 15, characterised in that said plurality of monitoring  
5 apparatuses ( $S_1, \dots, S_k, \dots, S_n$ ) comprises:

- a memory ( $H_k$ ) for storing at the level of the corresponding point of said set ( $S_1, \dots, S_k, \dots, S_n$ ) said data indicative of the behaviour of said network, and
- 10 - a transmission module ( $M_k$ ) to transmit said data indicative of the behaviour of said network (N) to said collecting apparatus (H) by effect of the generation of said trigger signal.

17. System as claimed in any of the claims 13 a 16,  
15 characterised in that it comprises an apparatus for the central management (M) of the quality of service of the network configured to received said trigger signal (Trigger) from said at least one testing apparatus (B) and to broadcast said trigger signal to said at least  
20 one monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ).

18. System as claimed in any of the claims 13 a 17, characterised in that said at least one activating apparatus (A) and said at least one testing apparatus (B) mutually co-operate according to a general  
25 agent/server configuration, in which said activating apparatus (A) acts as agent and said verification apparatus (B) acts as server.

19. System as claimed in any of the previous claims 13 through 18, for measuring the quality of service of  
30 a telecommunication network comprising a plurality of interfaces ( $G_i, G_b$ ), characterised in that said at least one monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ) is an apparatus for monitoring the data transiting on one of said interfaces ( $G_i, G_b$ ).

20. System as claimed in any of the previous claims 13 through 19, characterised in that said at least one monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ) comprises a memory ( $H_k$ ) dimensioned to store data indicative of the behaviour of said network (N) relating to a given time window.

21. System as claimed in any of the previous claims 13 through 20, characterised in that it comprises at least one respective transmission channel ( $C, C_t$ ) to forward at least one signal between:

- said trigger signal to said at least one monitoring apparatus ( $S_1, \dots, S_k, S_n$ ), and
- said data indicative of the behaviour of the network (N) measured (F) and stored (H) starting from said at least one monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ).

22. System as claimed in any of the claims 13 to 21, characterised in that it is configured to transmit on said network (N) being monitored at least one signal between:

- said trigger signal to at least one monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ), and
- said data indicative of the behaviour of the network (N) measured (F) and stored (H) starting from said at least one monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ).

23. System as claimed in claim 22, characterised in that said at least one monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ) comprises an additional filtering module (T) to intercept said trigger signal transmitted on said network being monitored (N).

24. Computer program product able to be directly loaded into the memory of a digital computer and comprising portions of software code able to perform

said function of carrying out session at the application level on said network (N), within a method as claimed in any of the claims 1 through 12, when said computer program product is run on a digital computer.

5        25. Computer program product able to be loaded directly into a digital computer and comprising portions of software code able to carry out said steps of measuring (F) and storing (H) said data indicative of the behaviour of the network (N), within a method as  
10 claimed in any of the claims 1 through 12, when the computer program product is run on a digital computer.

26. Computer program product able to be loaded directly into the memory of a digital computer and able to carry out one among the step of verifying (B) the  
15 possible occurrence of a critical situation relating to said quality of service and the step of generating a trigger signal (Trigger) upon the occurrence of said critical situation, within a method as claimed in any of the claims 1 through 12, when said computer program  
20 product is run on a digital computer.

27. Computer program product able to be loaded directly into the memory of a digital computer and comprising portions of software code able to carry out at least one among the steps of:

25        - sending said trigger signal (Trigger) to the points of said set, and

         - collecting, by effect of the generation of said trigger signal, said data indicative of the behaviour of said network measured and stored in said set of  
30 points, within a method as claimed in any of the claims 1 through 12, when said computer program product is run on a digital computer.

28. Apparatus configured for use as said testing apparatus (A) in a system as claimed in any of the  
35 claims 13 through 23.

29. Apparatus configured for use as said monitoring apparatus ( $S_1, \dots, S_k, \dots, S_n$ ) in a system as claimed in any of the claims 13 through 23.

30. Apparatus configured for use as said collecting  
5 apparatus (H), within a system as claimed in any of the claims 13 through 23.

31. Apparatus configured for use as said apparatus for the centralised management (M) of the quality of service of the network within a system as claimed in  
10 claim 17.